

## PATENT ABSTRACTS OF JAPAN

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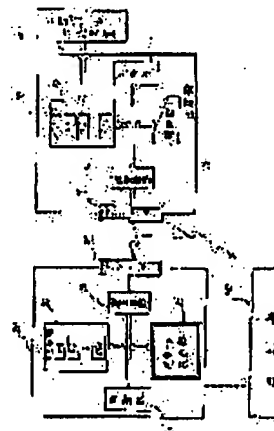
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### (54) INFORMATION DISPLAY DEVICE

#### (57)Abstract:

**PURPOSE:** To display a large quantity of information, the contents of advertisement and publicity without necessitating a large published space by providing an information reception part which outputs information which is held to an information display part and updates information which should be held based on control information transmitted by radio from an information transmission part.

**CONSTITUTION:** This device is provided with the information reception part which outputs the information which is held to the information display part and updates the information which should be held based on the control information transmitted by radio from the information transmission part. A control part 21 controls a pattern display part 23 to execute the display of an information pattern in specified order. When the control information is about the updating command of the information pattern stored in the 2nd storage area of a memory part 22, the control part 21 updates the stored contents in the 2nd storage area of the memory part 22 with a new information pattern given from a radio transmitter 10 side. Thus, a large quantity of information and the contents of advertisement and publicity are displayed without necessitating the large published space.



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## Specification

### 1. Title of the Invention

Information display device

### 2. Scope of Claims

#### 1. An information display device, comprising:

an information display portion, which displays provided information according to the mode of the information, and which, when other information is provided, updates displayed contents from said displayed information to the other information;

an information transmission portion, which holds information provided for display on said information display portion, and wirelessly transmits the held information sequentially in a prescribed order, as well as also wirelessly transmitting control information to control said information; and,

an information reception portion, which receives information wirelessly transmitted from said information transmission portion and holds the information, as well as outputting said held information to said information display portion based on control information wirelessly transmitted from said information transmission portion, and updating the information to be held.

2. The information display device according to Claim 1, characterized in that said information display portion and said information reception portion are

configured integrally, and that a plurality of such integrally configured members are provided in places at a distance from said information transmission portion, and in that said information display portion is a liquid crystal display device.

3. The information display device according to Claim 1 or Claim 2, characterized in that the information reception portion or said integrally configured members comprise storage means, which stores newly wirelessly transmitted information in place of previously stored information based on control information wirelessly transmitted from said information transmission portion for storage content update.

### 3. Detailed Description of the Invention (Objects of the Invention)

#### (Industrial Field of Use)

This invention relates to an information display device which is installed, for example, in trains or in buildings where numerous unspecified persons may gather, and which is suitable for providing various commercial advertisements and for giving announcement of various types of information.

#### (Prior Art)

In the prior art, as means of providing various commercial advertisements as well as announcement of various types of information other than commercial

advertisements to numerous unspecified persons in places such as those described above, methods are employed in which, for example, holding portions which detachably hold posters or other printed matter are provided at prescribed positions within trains, and posters or other printed matter is held by the holding portions. Also, methods are employed in which various advertising materials are mounted on the numerous handstraps arranged in rows within trains, as so-called handstrap advertisements. Although sizes are far smaller than the above-described holding portions, these so-called handstrap advertisements likewise entail mounting holding portions on handstraps which detachably hold printed matter, and causing these holding portions to hold various printed matter. In addition, methods are also employed of directly affixing posters and various other printed matter to the windows of trains and similar.

(Problems to be Solved by the Invention)

However, in all of the above-described methods of the prior art, printed matter is used as the advertisement media or as the informational announcement media, and so if the printed matter which is the advertisement media or the informational announcement media is not replaced with other printed matter, the displayed contents do not change. Hence if there is a need to modify the displayed contents, two tasks, which are the manufacture of new printed matter, and the

replacement of the previous printed matter with the new printed matter, are necessary and indispensable. However, when a train is long and consists of many cars, and when there are numerous places of display of advertisements and similar, of the above two tasks, performance of the latter task involves considerable labor and is not easy. In particular, the task of stripping away advertisement media and similar which has been directly affixed to the windows of trains and similar requires still more labor. Also, in order to alleviate the burden of the above-described labor-intensive tasks while expanding the informational contents of announcements and the amount of information, a large space is necessary to display advertisement media, and so there is the problem that realization of such goals is difficult.

As is clear from the above, conventional methods for displaying printed matter as advertisement media and as informational announcement media in prescribed places have had the problems that an extremely large amount of labor is required by the task of manufacturing the printed matter and by the task of replacing printed matter already being displayed with new printed matter, and that, when there is insufficient leeway with respect to display space, limits are imposed on the advertisement and announcement contents and on the amount of information.

Hence the present invention was devised in order to resolve the above problems, and has as an object the provision of an information display device which can display the contents of large amounts of information, advertisements and announcements, without requiring a large display space, by modifying in time the contents of advertisements and announcements without requiring large amounts of labor to change the contents of advertisements and announcements.

(Configuration of the Invention)

(Means to Solve the Problems)

In order to attain the above objects, an information display device of this invention comprises an information display portion, which displays provided information according to the mode of the information, and which, when other information is provided, updates displayed contents from the displayed information to the other information; an information transmission portion, which holds information provided for display on the information display portion, and wirelessly transmits the held information sequentially in a prescribed order, as well as also wirelessly transmitting control information to control the information; and, an information reception portion, which receives information wirelessly transmitted from the information transmission portion and holds the information, as well as outputting the held information to the information display portion based on

control information wirelessly transmitted from the information transmission portion, and updating the information to be held.

(Action)

In the above configuration, the information display portion displays provided information according to the mode of the information, and updates the displayed contents from the displayed information to other information when other information is provided; the information transmission portion holds information provided for display by the information display portion, and wirelessly transmits, sequentially in a prescribed order, the held information, as well as also wirelessly transmitting control information to control the information; and the information reception portion receives information wirelessly transmitted from the information transmission portion and holds the information, as well as outputting the held information to the information display portion based on control information wirelessly transmitted from the information transmission portion, and updating the information to be held. By this means, the contents of large amounts of information, advertisements, and announcements can be displayed, without requiring a large display space, by modifying in time the contents of advertisements and announcements without requiring large amounts of labor to change the contents of advertisements and announcements.



(Embodiments)

Below, an embodiment of the invention is explained using the drawings.

Fig. 1 is a block diagram showing the overall configuration of an information display device according to one embodiment of the invention.

As shown in Fig. 1, the information display device according to one embodiment of the invention is configured primarily comprising an external pattern creation device 26, a wireless transmitter 10, and a plurality of display panels 20 to N0. The above configuration is explained in greater detail as follows.

That is, the external pattern creation device 26 creates patterns of the various information for display on the plurality of display panels 20 to N0, described in detail below, and outputs the patterns to the wireless transmitter 10, and is connected to the wireless transmitter 10 via the pattern data input terminal 16. As the external pattern creation device 26, various information processing devices may be used, such as for example a multi-functional word processor capable of forming various display images having as elements *kanji* and *kana* characters, English alphabet characters and various other characters, geometric shapes, and various other drawings, patterns, numerals, symbols, and similar.

The wireless transmitter 10 comprises, in addition to a control portion 11, a memory portion 12, input

portion 13, transceiver portion 14, antenna 15, and the pattern data input terminal 16 already described. The memory portion 12 comprises a first storage region and a second storage region, which each store various different kinds of data. The first storage region stores various programs and nonvolatile fixed data and similar related to control operation of the wireless transmitter 10. As shown in Fig. 1, the second storage region stores various information patterns P1, P2, ..., PN which form display images, already described. The various information patterns P1, P2, ..., PN forming display images are provided sequentially from the external pattern creation device 26 via the pattern data input terminal 16; under the control of the control portion 11, the second storage region continuously stores each of the information patterns P1, P2, ..., PN, or else deletes all or a portion of each of the information patterns P1, P2, ..., PN, according to their respective modes. The input portion 13 comprises a keyboard and various other mechanisms necessary to set and modify the operating mode of the wireless transmitter 13. Various instruction signals sent from the input portion 13 by keyboard input by an operator or similar pass through a bus line 27 arranged within the wireless transmitter 10 and are provided to the control portion 11. The transceiver portion 14 primarily comprises a modulator and demodulator, and under the control of the control portion

11, driving thereof is controlled by control signals provided by the control portion 11 via the bus line 27. That is, the transceiver portion 14 receives the various information data (in binary form) which has been sequentially read from the second storage region of the memory portion 12 by the control portion 11 and transferred over the bus line 27. Then, to enable wireless transmission via the antenna 15, this various data is for example frequency-modulated by using the various data signals to modulate a carrier wave, and is then output to the antenna 15. The antenna 15 receives the output signals from the transceiver portion 14 and performs wireless transmission. As is clear from the preceding explanation, the control portion 11 outputs control signals to the memory portion 12, transceiver portion 14 and similar via the bus line 27 to control the latter. That is, when a data read instruction signal is provided from the input portion 13 via the bus line 27, control portion 11 reads the various information pattern data provided from the external pattern creation device 26, and as shown in Fig. 1, stores the read data in the second storage region of memory portion 12. Further, when a data transmission instruction signal is provided from the input portion 13 via the bus line 27, control portion 11 sequentially reads all of or a portion of the stored data, while controlling the transceiver portion 14 via instruction signals, and wirelessly transmits the

data from the antenna 15 via the transceiver portion 14. And, when control information to control the various information patterns P1, P2, ..., PN described above on each of the display panels 20 to N0 is provided from the input portion 13, the control portion 11 wirelessly transmits the control information as well to the control portions 21 of each of the display panels 20 to N0 via paths similar to those above. Details of the above control information are described below.

The plurality of display panels 20 to N0, arranged at positions distant from the wireless transmitter 10, have the same internal structure as the display panel 20 shown in Fig. 1. Below, the display panel 20 is described in detail.

The display panel 20 comprises, in addition to the control portion 21, a memory portion 22, pattern display portion 23, transceiver portion 24, and antenna 25. The control portion 21, memory portion 22, transceiver portion 24 and antenna 25 comprised by the display panel 20 are substantially the same, respectively, as the control portion 11, memory portion 12, transceiver portion 14, and antenna 15 comprised by the above-described wireless transmitter 10. That is, the antenna 25 receives and outputs to the transceiver portion 24 the data signals transmitted from the antenna 15 of the wireless transmitter 10. The transceiver portion 24 primarily comprises a modulator and demodulator, and

under control by the control portion 21, the driving thereof is controlled by control signals provided by the control portion 21 via the bus line 28. The transceiver portion 24 receives and demodulates (that is, extracts the various data signals from) the carrier wave, provided by the antenna 25, which has been frequency-modulated in the transceiver portion 14 of the wireless transmitter 10, and outputs the signals to the bus line 28. The memory portion 22 is placed under the control of the control portion 21, and the driving thereof is controlled by control signals provided by the control portion 21 via the bus line 28, and comprises a first storage region and a second storage region, which store various different types of data. The first storage region stores various programs, nonvolatile fixed data and similar related to control operation of the display panel 20. As shown in Fig. 1, the second storage region stores various information patterns P1, P2, ..., PN which form images for display on the pattern display portion 23. The various information patterns P1, P2, ..., PN which form the above display images are binary data, provided sequentially from the transceiver portion 24 via the bus line 28. Under control by the control portion 21, each of the various information patterns P1, P2, ..., PN in the second storage region is stored according to the respective mode, and all or a portion of the various information patterns P1, P2, ..., PN are deleted.

Further, when under control of the control portion 21, when new information patterns different from those above are provided, the stored contents are updated from the above various information patterns to the new information patterns. The pattern display portion 23 is placed under the control of the control portion 21, and display driving thereof is controlled by means of control signals provided by the control portion 21 via the bus line 28. In this embodiment, a liquid crystal display is adopted as the pattern display portion 23, to reduce power consumption and to achieve a thin display shape. In this embodiment, as explained above, the pattern display portion 23 primarily comprises a liquid crystal display; however, configurations of the pattern display portion 23 are also possible comprising numerous LEDs and numerous power supplies providing driving power to the numerous LEDs, or similar. Further, in place of the liquid crystal display or numerous LEDs, a small-size television receiver such as is commonly used may also be employed. As is clear from the above explanation, the control portion 21, by outputting control signals via the bus line 28 to the memory portion 22, pattern display portion 23, transceiver 24 and similar, controls these portions. That is, the control portion 21 receives control information wirelessly transmitted from the control portion 11 of the wireless transmitter 10, via the bus line 28, transceiver portion 24 and antenna 25, and based

on this control information, sequentially reads the various information pattern data provided from the transceiver portion 24 via the bus line 28, and causes the read data to be stored in the second storage region of the memory portion 22, as shown in Fig. 1. Further, based on the control information, the control portion 21, while controlling the pattern display portion 23, sequentially reads and causes to be displayed on the pattern display portion 23 all of or a portion of the data stored in the second storage region of the memory portion 22.

In the above configuration, when as a result of input from the input portion 13 by an operator, control information wirelessly transmitted from the control portion 11 of the wireless transmitter 10 is a display instruction to cyclically display, at prescribed periods, each of the various information patterns P1, P2, ..., PN, the control portion 21 executes control of the pattern display portion 23 to display each of the various information patterns P1, P2, ..., PN in order on the pattern display portion 23 each time the prescribed period elapses, and when display of the final information pattern PN ends, to again return to display of the initial information pattern P1. Further, when control information wirelessly transmitted from the control portion 11 is a display instruction to display every other of the information patterns, for example displaying

first P1, P3, P5, ..., PN-i, and then displaying P2, P4, P6, ..., PN, the control portion 21 executes display of information patterns in the above order by controlling the pattern display portion 23. Further, when the above control information is related to an update instruction for information patterns stored in the second storage region of memory portion 22, the control portion 21 executes updating of the stored contents of the second storage region of the memory portion 22 with information patterns newly provided by the wireless transmitter 10.

By means of the above-described configuration, when the display contents of certain information patterns among the information patterns P1, P2, ..., PN themselves change with the passage of time, the control portion 21 controls the pattern display portion 23 such that the displayed contents in the pattern display portion 23 change according to the information pattern mode.

Further, based on control information wirelessly transmitted from the control portion 11 of the wireless transmitter 10, the various information patterns stored in the second storage area of the memory portion 22 are deleted, and new information patterns are written to the second storage region (that is, information patterns for storage are updated).

This embodiment has assumed cases in which the wireless transmitter 10, as the means for transmitting various information pattern data to the plurality of



provided display panels 20 to 0N, is considerably distant from the plurality of display panels 20 to 0N, and cases in which, when a plurality of display panels 20 to 0N are provided in train cars or other transportation facilities, transmission of information pattern data by wire transmission is impossible; but when transmission of information pattern data to the display panels 20 to 0N can be executed, of course information pattern data may be transmitted by wire transmission. If the display panels 20 to 0N of this embodiment are improved to obtain thin hanging-type wall-mounted displays, then mounting is possible in appropriate locations on the handstraps and walls within trains, without requiring large amounts of space.

As explained above, by means of an embodiment of this invention, a plurality of information patterns provided to the second storage region of the memory portion 22 can be displayed in succession on the pattern display portion 23 as time elapses, and updating of the display contents in the pattern display portion 23 can also be performed automatically as time elapses, so that highly noticeable advertisements and announcements can be presented. Hence utilization for commercial advertisements in trains and other transportation (and particularly in the *Shinkansen* or "Bullet Train" and similar) and in rooms and similar, and for various informational announcements, is possible. Further, by

transmitting control signals to each of the display panels 20 to 0N from the wireless transmitter 10, the storage contents of all the memory portions 22 of the display panels 20 to 0N can be updated in an extremely short time, so that there is no longer a need for the tasks of replacing printed matter of the prior art, or other tasks requiring an excessive amount of labor.

In this embodiment, the external pattern creation device 26 and the wireless transmitter 10 were configured separately; but, the external pattern creation device 26 may for example be built into the wireless transmitter 10, or the wireless transmitter 10 may be incorporated into the external pattern creation device 26.

(Advantageous Results of the Invention)

As explained above, by means of this invention, an information display device can be provided in which, information which has been wirelessly transmitted in sequence from an information transmission portion as information for display on an information display portion, the display contents of which are to be updated, is received, and the information is held; in addition, based on control information wirelessly transmitted from the information transmission portion to control the information, the held information to be output to the information display portion, and information to be held, are updated; by this means, advertisement and announcement contents can be modified in time without

requiring large amounts of labor to update the contents of advertisements and announcements, so that the contents of large amounts of information, advertisements, and announcements can be displayed without requiring a large amount of display space.

#### 4. Brief Description of the Drawings

Fig. 1 is a block diagram showing the overall configuration of an information display device according to one embodiment of the invention.

10: wireless transmitter, 11, 21: control portion, 12, 22: memory portion, 13: input portion, 14, 24: transceiver portion, 15, 25: antenna, 16: pattern data input terminal, 20 to 0N: display panel, 23: pattern display portion, 26: external pattern creation device.